Enamel May Still Need Phosphoric Acid Etch with Self-Etch Resin Luting Agents (3/08)


Resin-based luting agents are indicated for luting most all ceramic, indirect restorations. Resin luting agents should be preceded by a dental adhesive before cementation, which traditionally has been provided by either etch-and-rinse or self-etch adhesives. The most recently marketed resin cements are formulated to provide both simultaneous etching and adhesion to the dentin/enamel substrate. This study evaluated the marginal integrity of ceramic inlays luted with different adhesives and resin cements before and after thermo-mechanical loading. MOD cavities with one proximal box beneath the cementoenamel junction were prepared in 72 extracted human third molars. IPS Empress inlays were luted with nine combinations of adhesive and luting composite or self-etch cement alone (n=8): Prime & Bond NT Dual-Cure + Calibra; XP BOND SCA + Calibra; XP BOND SCA light-cured + Calibra; Syntac + Variolink II; Multilink Primer + Multilink; AdhesSE Dual Cure + Variolink II; ED Primer + Panavia F 2.0; RelyX Unicem; and Maxcem. Marginal quality was analyzed under a scanning electron microscope (SEM) using epoxy resin replicas before and after thermo-mechanical loading (100,000 × 50 N and 2500 thermocycles between +5 and +55 °C). Results found that all systems involving the etch-and-rinse adhesives resulted in significantly higher percentages of gap-free margins in enamel than all other luting systems. For dentin margins, all groups exhibited similar amounts of gap-free margin areas except for two groups which exhibited more marginal gaps (Prime and Bond NT + Calibra and Maxcem). The authors concluded that overall etch-and-rinse adhesives appear to be the most promising for the luting of ceramic inlays, whereas self-etch adhesives and self-etch cements are not as efficient as etch-and-rinse adhesives in enamel bonding performance.

DECS Comment: Self-etch resin luting agents hold the promise of possibly lowering the technique sensitivity usually present in the application of etch-and-rinse adhesives. Furthermore, self-etch luting systems possibly could address concerns of adhesive layers preventing the seating of restorations. Self-etch adhesives do have limitations, especially in the ability to adequately etch enamel. In fact, some self-etch adhesive products recommend an additional enamel etch procedure before the self-etch adhesive is applied. Under the conditions of this study all but two groups (one self-etch resin luting agent and one etch-and-rinse adhesive-resin luting agent combination) provided similar marginal integrity on dentin finish lines. However, only the etch-and-rinse adhesives provided better marginal integrity on enamel. This study reinforces other studies that suggest that restoration margins may benefit from an additional acid etch of enamel margins before using a self-etch luting agent.

References